Dear Valued Customer,

Thank you for purchasing Patton Electronics products! We do appreciate your business. I trust that you find this user manual helpful.

We manufacture one of the widest selections of data communications products in the world including CSU/DSU's, network termination units, powered and self-powered short range modems, fiber optic modems, interface converters, baluns, electronic data switches, data-line surge protectors, multiplexers, transceivers, hubs, print servers and much more. We produce these products at our Gaithersburg, MD, USA, facility, and can custom manufacture products for your unique needs.

We would like to hear from you. Please contact us in any of the following ways to tell us how you like this product and how we can meet your product needs today and in the future.

Web:	http://www.patton.com
Sales E-mail:	sales@patton.com
Support E-mail:	support@patton.com
Phone - Sales	(301) 975-1000
Phone - Support	(301) 975-1007
Fax:	(301) 869-9293
Mail:	Patton Electronics Company 7622 Rickenbacker Drive Gaithersburg, MD 20879 USA

We are committed to a quality product at a quality price. Patton Electronics is BABT and ISO 9001 certified. We meet and exceed the highest standards in the industry (CE, UL, etc.).

It is our business to serve you. If you are not satisfied with any aspect of this product or the service provided from Patton Electronics or its distributors, please let us know.

Thank you.

Burton A.Patton
Executive Vice President

P.S. Please tell us where you purchased this product.

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USER MANUAL

MODEL 2036 and 2037

Parallel to Serial/ Serial to Parallel Interface Converters

PATTON Electronics Co.

An ISO-9001 Certified Company

Part #07M2036-C
Doc #102061UC
Revised 08/17/99

SALES OFFICE
(301) 975-1000
TECHNICAL SUPPORT
(301) 975-1007
http://www.patton.com

1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 2036 and 2037 components to be free from defects, and will—at our option—repair or replace the products should they fail within one year from the first date of shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If these products fail or do not perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall **Patton Electronics** be liable for any damages incurred by the use of these products. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. **Patton Electronics** specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

1.1 RADIO AND TV INTERFERENCE

The Model 2036 and Model 2037 generate and use radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. They have been tested and found to comply with the limits for Class A computing devices in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If they do cause interference to radio or television reception, which can be determined by disconnecting the RS-232 interface, the user is encouraged to try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, re-orienting the receiving antenna and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

1.2 CE NOTICE

The CE symbol on your Patton Electronics equipment indicates that it is in compliance with the Electromagnetic Compatibility (EMC) directive and the Low Voltage Directive (LVD) of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

1.3 SERVICE

All warranty and non-warranty repairs must be returned freight prepaid and insured to Patton Electronics. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from Patton Electronics Technical Support: **(301) 975-1007, http://www.patton.com,** or; **support@patton.com**..

NOTE: Packages received without an RMA number will not be accepted.

Patton Electronics' technical staff is also available to answer any questions that might arise concerning the installation or use of your Model 2036 or Model 2037. Technical Support hours: **8AM to 5PM EST, Monday through Friday.**

2.0 GENERAL INFORMATION

Thank you for your purchase of this Patton Electronics product. This product has been thoroughly inspected and tested and is warranted for One Year parts and labor. If any questions or problems arise during installation or use of this product, please do not hesitate to contact Patton Electronics Technical Support at (301) 975-1007.

2.1 FEATURES

- Converts parallel data to serial data or vice versa
- Automatically selects parallel-to-serial or serial-to-parallel operation
- Automatically selects DCE/DTE modes
- Serial data rates to 115,200 bps
- No AC power required
- Supports both software and hardware flow control
- A five-state LED monitors status and diagnostics
- External configuration switches
- Ultra-miniature size
- Made in the USA

2.2 DESCRIPTION

The Patton Model 2036 and 2037 Parallel to Serial Converter automatically convert RS-232 serial data to parallel data format or vice versa. Incorporating advanced microprocessor technology, the Model 2036 and 2037 automatically sense and select parallel and serial modes, as well as DCE/DTE modes. Requiring no AC power, the Model 2036 and 2037 support serial data rates to 115,200 kbps.

For easy configuration, the Model 2036 and 2037 feature a convenient set of external configuration switches. These accessible configuration switches allow the user to control baud rate, parity, word length and flow control. An easy-to-read LED indicator displays status and operating condition.

Housed in an ultra-miniature ABS plastic case, the Model 2036 comes equipped with a DB-25 female or male connector on the serial side and a Centronics™ 36 pin male connector on the parallel side. The Model 2037 is housed in the same convenient case and comes equipped with a DB-25 female connector on the serial side and male *or* female connector on the parallel side.

3.0 CONFIGURATION

The Model 2036 and 2037 are simple to install and designed for excellent reliability. The following instructions will help you set up and install your converter properly. If you have any questions, please call Patton Technical Support at (301) 975-1007.

3.1 CONFIGURATION SWITCHES

The Model 2036 and 2037 each use a set of eight external DIP switches (see Figure 1) that allow configuration to a wide range of applications. Because all eight switches are in one externally accessible DIP switch package, there is no need to open the case for configuration. The configuration switches allow you to select data rates, parity, word length and flow control selection. The following section describes all switch locations, positions and functions.

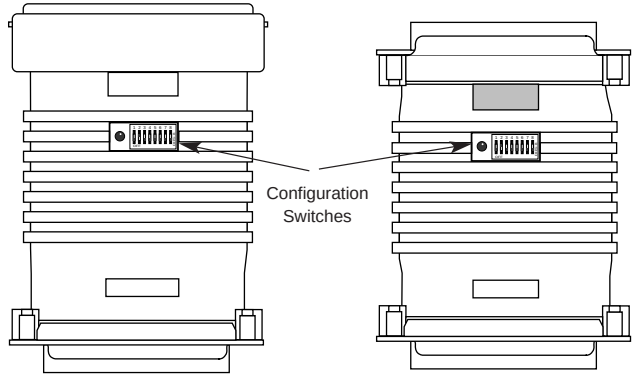


Figure 1. The location of the configuration switches: the Model 2036 (left) and the Model 2037 (right)

The Model 2036 and 2037 each use a *miniature* configuration switch package. To configure your unit, use a small screwdriver and gently push each switch to its proper setting. The ON and OFF positions are shown in Figure 2. Default settings for the DIP switches are shown in the table on the following page. Detailed settings follow the table.

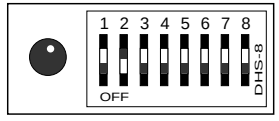


Figure 2. The miniature configuration switch package

DIP SWITCH SUMMARY TABLE			
Position	**Function**	**Factory Default**	
SW1	Flow Control	Off	Hardware
SW2	LED Indicator	On	Enabled
SW3	Data, Parity, Stop Bits	Off	8B, NP, 1S
SW4	Data, Parity, Stop Bits	Off	
SW5	Data, Parity, Stop Bits	Off	
SW6	Data Rate	Off	38400 bps
SW7	Data Rate	Off	
SW8	Data Rate	Off	

3.2 DETAILED SWITCH SETTINGS

This section provides detailed information about the function of each DIP switch and lists all possible settings.

Switch 1: Hardware/Software Control

The setting for Switch 1 determines whether these interface converters will control either hardware or software flow control.

Flow Control	**SW1**
Hardware	OFF
Software	ON

Switch 2: Enable/Disable LED Indicator

The setting for Switch 2 determines whether the LED indicator is enabled or disabled.

LED	**SW2**
Enabled	ON
Disabled	OFF

Switch 3 through 5: Data, Parity and Stop Bit

Switches 3 through 5 are used to specify the data, parity and stop bits. The following table shows the settings that may be used:

Data	**Parity**	**Stop Bit**	**SW3**	**SW4**	**SW5**
7B	EP	1S	ON	ON	ON
7B	OP	1S	OFF	ON	ON
7B	NP	2S	ON	OFF	ON
7B	EP	2S	OFF	OFF	ON
7B	OP	2S	ON	ON	OFF
8B	EP	1S	OFF	ON	OFF
8B	OP	1S	ON	OFF	OFF
8B	NP	1S	OFF	OFF	OFF

Switches 6 through 8: Frequency and Data Rate

Switches 6 through 8 determine the frequency and data rate. The following chart shows the settings that may be used:

Model 2036 and 2037			
Data Rate	SW6	SW7	SW8
1200	OFF	OFF	ON
2400	ON	OFF	ON
4800	ON	ON	OFF
9600	OFF	ON	ON
19200	ON	ON	ON
38400	OFF	OFF	OFF
57600	ON	OFF	OFF
115200	OFF	ON	OFF

4.0 INSTALLATION

The Patton Model 2036 and 2037 are very simple to install. Once you have configured the DIP switches, just plug your converter in to a standard cable and you're ready to go. Figure 3 illustrates the proper connections for the Model 2036 and 2037. If you have special-ordered a non-standard connector, your connections may be different.

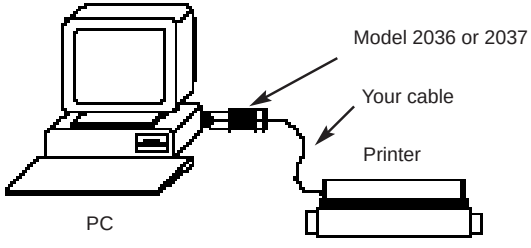


Figure 3. Installing the Model 2036

5.0 OPERATION

Once your interface converter is properly configured and installed, it should operate transparently—as if it were a standard cable connection. Operating power is derived from the RS-232 data and control signals; there is no "ON/OFF" switch.

5.1 LED STATUS MONITORS

The Model 2036 and 2037 feature an easy-to-read LED that shows the operating status of the Model 2036. Figure 1 (page 4) shows the location of these LEDs. The following chart describes the LED's status codes.

LED Codes	
● ● – ● —— ● ● – ● ——	Computer is sending data
● —— ● —— ● ——	Serial device is connected; computer is not sending data
● ● —— ● ● ——	Both serial and parallel devices are connected; computer not sending data
● – ● —— ● – ● ——	Printer not ready, data held in buffer
● ● ● ● ——● ● ● ●	Computer ignoring flow control, data lost

Please refer to the following key to interpret the above status codes:

Key:	
●	Blink
–	Short pause
——	Long pause

APPENDIX A

PATTON MODEL 2036 AND 2037 SPECIFICATIONS

Interface: Asynchronous., RS-232C compatible

Connectors: (Model 2036)
Serial: DB-25 male or female;
Parallel: Centronics 36 pin male
(Model 2037)
Serial: DB-25 female;
Parallel: DB-25 male or female

Data Rates: 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 bps

LED: LED displays status and operating condition

Power Supply: Uses power from RS-232 interface; 9Vdc maximum typical current = 20mA; Typical maximum power consumption = 100mW @ 5V (20mA)

Data Format: 7 or 8 data bits; 1 or 2 stop bits; even, odd or no parity

Temperature Range: 0-60°C (32-140°F)

Altitude: 0-10,000 feet

Humidity: 5 to 95% noncondensing

Dimensions: 3.37" x 2.43" x 0.76" (Model 2036);
3.13" x 2.12" x 0.73" (Model 2037)

Weight: 2 oz. (56.8 grams)

APPENDIX B

PATTON MODEL 2036 AND 2037 INTERFACE CONNECTIONS

36 PIN CENTRONICS PARALLEL PORT CONNECTIONS

Pin	Description	Direction	
		Serial to Parallel	Parallel to Serial
1	Strobe	Output	Input
2	Data Bit 0	Output	Input
3	Data Bit 1	Output	Input
4	Data Bit 2	Output	Input
5	Data Bit 3	Output	Input
6	Data Bit 4	Output	Input
7	Data Bit 5	Output	Input
8	Data Bit 6	Output	Input
9	Data Bit 7	Output	Input
10	Acknowledge	Input	Output
11	Busy	Input	Output
12	Paper End (to ground through resistor)	Input	Output
13	Select	Input	Output
14	To +5V through resistor		
15	Error	Input	Output
16	To +5V through resistor		
17	To +5V through resistor		
18	Ground		
19			
20			
21			
22			
23			
24			
25			

Note: All other pins are unconnected

DB-25 PORT CONNECTIONS

Pin #	Signal Name	Description	Connected to DTE	Connected to DCE
1	FG	Frame Ground		
2	TD	Transmit Data	Input & Power Source	Output
3	RD	Receive Data	Output	Input & Power Source
4	RTS	Request to Send	Input & Power Source	Output
5	CTS	Clear to Send	Output	Input & Power Source
6	DSR	Data Set Ready	Output	Input & Power Source
7	SG	Signal Ground		
8	CD	Carrier Detect	Output	Input & Power Source
9	V+	External Power Source	Input for Power	Input for Power
20	DTR	Data Terminal Ready	Input & Power Source	Output

Note: All other pins are unconnected

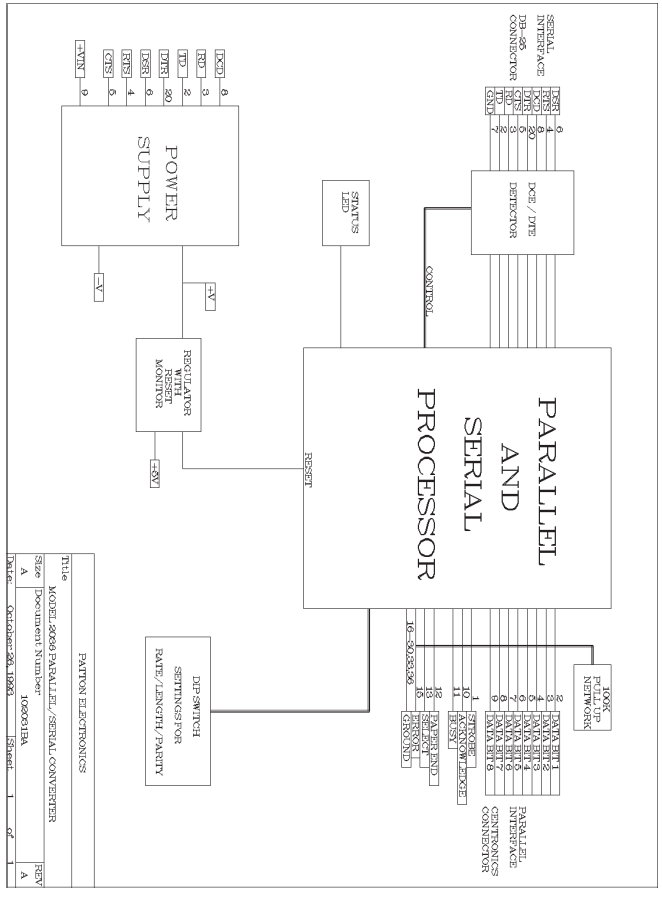
APPENDIX B
(continued)

SIGNAL DIRECTIONS

Converter Function	Serial Port Connected	Serial Data Flow	Serial Software Flow Ctrl. Signal (XON/XOFF)	Serial Hardware Flow Ctrl Signal (DTR, CTS, DSR)
Serial to Parallel	DTE	TD	RD	CTS, DSR
Serial to Parallel	DCE	RD	TD	DTR
Parallel to Serial	DTE	RD	TD	DTR
Parallel to Serial	DCE	TD	RD	CTS, DSR

APPENDIX D

PATTON MODEL 2036 BLOCK DIAGRAM



APPENDIX D

PATTON MODEL 2037 BLOCK DIAGRAM